

**CONTENT STANDARD 8: Production Systems**

*Students will understand and be able to demonstrate the methods involved in turning raw materials into usable products.*

**K - 12 PERFORMANCE STANDARDS**

Educational experiences in **Grades K-4** will assure that students:

- define *technological system*;
- identify the parts of a system;
- use a technological system;
- describe the function of various systems;
- describe the input, process, output, feedback (IPOF) system model; and
- demonstrate an IPOF system.

Educational experiences in **Grades 5-8** will assure that students:

- define manufacturing terminology, including interchange ability, automation, standardization, etc.;
- describe how products are manufactured using the methods of single craftsman, line and mass, and automated-robotics manufacturing;
- identify and describe the tools, materials and methods used in manufacturing products;
- identify the characteristics of sub- and superstructures;
- identify and describe the tools, materials and methods used in constructing sub- and superstructures;
- design, construct and test models of shelters and other structures; and
- produce a product using a simple production sequence: layout, shaping, smoothing, assembly and finishing techniques.

Educational experiences in **Grades 9-12** will assure that students:

- describe the relationship between the universal systems model and production technology;
- differentiate between manufacturing and construction systems;
- trace the historical development of the construction industry;
- differentiate between residential and commercial construction systems;
- describe the significance of architectural drawings, specifications and contracts in the construction industry;
- describe and apply the process of site selection and preparation;
- demonstrate an ability to read and interpret architectural renderings;

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K-12 PERFORMANCE STANDARDS, continued

Educational experiences in **Grades 9-12** will assure that students:

- demonstrate the safe and accurate use of layout, forming, separating, combining, treating, and finishing tools and procedures in building a shelter or structure;
- identify, describe and apply the structural elements used in commercial floor, wall and roofing systems;
- identify and describe the nonstructural characteristics of plumbing, electrical and environmental systems used in construction;
- complete a cost estimation, create a critical path network, and construct a small full-scale shelter or structure;
- discuss advanced construction systems and the role they play in future societies;

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K-12 PERFORMANCE STANDARDS, continued

Educational experiences in **Grades 9-12** will assure that students:

- discuss the problems and possibilities of construction practices in the alternative environmental colonization settings of submarine, space and extra planetary;
- trace the historical evolution of manufacturing;
- discuss the advantages of environmentally conscious manufacturing;
- demonstrate an ability to safely and accurately use the layout, form, separate, combine, treat and finish tools and processes in manufacturing a product;
- distinguish between custom, just-in-time and flexible manufacturing techniques;
- generate and operate a computer numerical control (CNC) program;
- describe computer-integrated manufacturing (CIM); and
- describe space industrialization and list several products that are manufactured from secondary materials produced in a microgravity environment.